

## A Place in Berkeley Where People Can Learn How to Build Things



Liz and Zach Radding

Berkeley Lab's Zach Radding had a dream. And in a few months, the citizens of Berkeley will be able to see firsthand how the young engineer turned that dream into a reality. It's all taking shape at the corner of Adeline and Harmon, just south of the Ashby BART station.

Going up is a three-story, 8,000-square-foot monument to one man's ingenuity.

Radding and his wife Liz refurbished and sold two old houses in the East Bay, work-

ing nights and weekends over a two-year period, to raise the capital for something they call "Zach's Cool Stuff."

"It's not a school. It won't have a classroom feel," he says of the new building. "It will be an educational facility. The space will be open and modular. And we'll teach people how to build things," like computer-controlled lasers, six-legged robotic pets, and holograms...anything that's "cool."

Anyone over 13 will be able to attend "Zach's Cool Stuff," and teachers will be especially welcome. Students will

sign up for their time, pay a fee, and curricula will be tailored to their interests.

Ground was broken last June, and the Raddings are hoping to open by end of 2004. Find out more about "Zach's Cool Stuff" at [www.buildcoolstuff.com](http://www.buildcoolstuff.com).



Artist's rendition of the building that will house "Zach's Cool Stuff," to be located near Adeline and Harmon Streets in south Berkeley.

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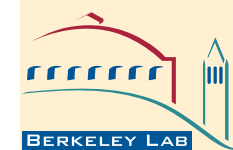
Editor: Lyn Hunter (510)486-4698

Community Relations: Terry Powell (510) 486-7292

Education Outreach: Rollie Otto (510) 486-5325

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# Science on the Hill

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## Nano\*High Demystifies the World of Nanotechnology

It has no library or gymnasium, one classroom, and its teachers are university professors. There are no textbooks or social clubs, but it boasts one of the most dramatic campuses in the world, and in its curriculum one might find the future of science.

Welcome to Nano\*High, a most unusual "high school" created by a partnership of Berkeley Lab science educators and materials scientists.

Created by the Molecular Foundry, Nano\*High consists of free Saturday lectures, each of which is followed by tours. Their focus is the "nanoworld" of the ultrasmall, a field that shows enormous promise for advances in medicine, computing, energy efficiency, and virtually all areas of science.

### Upcoming Nano\*High Lectures

**Feb. 7**  
John Clarke — "Super" conductors, SQUIDS, and Your Brain

**March 20**  
Alex Pines — Looking Beyond the Light: From Molecules to Brains

**April 24**  
Robert Ritchie — Micromachines

**May 8**  
Alex Zettl — Building the World's Smallest Electric Motor

"Nano\*High is part of the educational outreach mission of the Molecular Foundry," said Sally Nasman, the program's administrator. "We want to give high school students and their teachers an opportunity to learn more about this field, and this is our way of giving back to the community."

Nano\*High's audience includes both science-minded and nonscience-oriented high schoolers — it is billed as "nanoscience for future scientists, poets and presidents."



After the Saturday Nano\*High lectures, students visit labs where nanoscience research is taking place.

The asterisk in the title is intended to explain, to those not familiar with the term, on what scale nano work takes place — "a human hair is 50,000 nanometers across."

"We hope to demystify the nanoworld," said Paul Alivisatos, director of the sponsoring Molecular Foundry at Berkeley Lab and a professor of chemistry at UC Berkeley. "Our instructors are faculty known for their exceptional teaching ability, engaging lecture style, and an interest in bringing the world of modern science to pre-college students."

The talks will continue through May (see schedule at left) in the Building 66 Auditorium, each one beginning at 10 a.m.

To reserve a spot, go to the Nano\*High web site, [www.lbl.gov/nanohigh](http://www.lbl.gov/nanohigh), or call Nasman at 486-4714. A shuttle bus runs from the downtown Berkeley BART station at 9:30 a.m., and back at the conclusion of the program.

## Lab Contract is Extended, Competition Formally Announced



The Department of Energy (DOE) has announced that the University of California's (UC) contract to manage Berkeley Lab has been extended through Jan. 31, 2005. UC President Robert Dynes commented that "We have a long tradition of scientific and engineering excellence at Berkeley Lab, and we are tremendously proud of the Lab's groundbreaking achievements in so many fields of inquiry. Under this contract extension, we will continue our commitment to

scientific excellence, effective management, and public accountability.

DOE has also announced it will be competing the management contract of Berkeley Lab over the next year, to be concluded by Jan. 1, 2005. While the UC Board of Regents have not made a formal decision to compete, Dynes said "the University continues to prepare as if we will compete, and if the Regents indeed authorize our participation in the competition, I assure you that we will do so aggressively."

# Phyllis Gale Sheds Light on Berkeley’s Early Women

To say Phyllis Gale’s life is steeped in history is a bit of an understatement. It’s part of nearly every breath and thought she has. And now her love of the past is on full display for others to see. Gale – a contract officer at the Lab’s Sponsored Projects Office for the last 15 years – recently curated an exhibit on the women who helped shape the city of Berkeley during its first 75 years (1878-1953).



Mary McHenry Keuh, 1858-1947, was known as the mother of Berkeley’s suffragette movement.

A life-long history enthusiast, Gale’s interest in Berkeley’s early women began after meeting her husband and finding out he was from one of the city’s older families, and that his great grandmother – Idela Reed Marston – kept a diary. “Several copies of the diary were made, one of which my husband had,” says Gale. “It has shed a lot of light on the role women played during Berkeley’s early years.”

Based on the diary, and subsequent research, Gale learned that while the women of early Berkeley rarely worked and held few positions of power, they found ways to exert their influence on the city.

“Through the creation of clubs,” says Gale, “they built a sort of shadow government, through which they could implement the kinds of reforms they thought were important for the community.”

Gale spent hundreds of hours poring over letters, books, oral histories, and photo archives, gleaning pertinent facts and editing them down to a manageable size. While some might find this process tedious, she found it fascinating.

“As I was reading this material, these historical figures seemed to come to life before me, and it was amazing how intertwined their lives were,” says Gale. “I was so taken by the selflessness of these women.”

The “Early Berkeley Women (1878-1953)” exhibit – sponsored by the Berkeley Historical Society and the College Women’s Club – will be on display at the Berkeley History Center, 1931 Center St., through March 27. For information, call 848-0181.



Phyllis Gale

## Science Education

### Let There Be Light Kits

A mirror, a laser pointer, and a prism. Last fall, kits containing these and other thought-provoking items were given to science teachers from Longfellow, Martin Luther King, and Willard Middle Schools in Berkeley.

Berkeley Lab’s ‘properties of light’ kits—designed so teachers can instruct their students on how the angle of incidence equals the angle of reflection—were created to help the Berkeley Unified School District strengthen and update their science program.

The kits will be given to about a dozen middle school science teachers in the district, or one for every seventh and eighth grade science class. Similar kits exploring other scientific concepts are planned for the future.



### Lab Helps Train Berkeley Firefighters

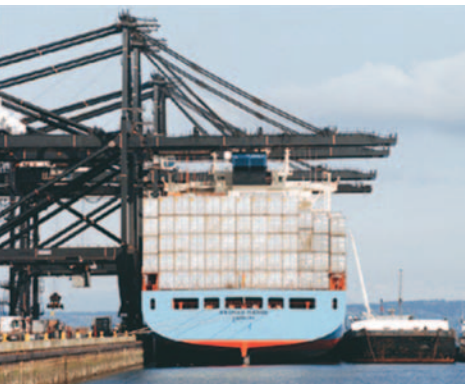
That firefighters do everything from extinguishing flames to rescuing cats is well known. But since Sept. 11, this intrepid group of public servants has had to add new skills that allow them to respond safely and effectively to acts of terrorism.

Berkeley firefighters have received training in chemical and biological terrorism, says Craig Green, an assistant chief at the department, but lacked a resource for learning about radiation.

The solution to their problem lay right up the hill. The Lab is home to numerous experts on the topic, and several of them recently taught a class on the scientific properties of radiation and its health effects to a group of nearly 100 Berkeley firefighters.

Green is excited about the budding relationship between the firefighters and the Lab. “We don’t have all the knowledge, resources, or equipment needed to deal with radiological emergencies,” he says. “Working with the Lab helps us dramatically on all these fronts, and better prepares us to deal with these kinds of disasters, should they arise.”

# Researchers Develop A Better Way to Protect the Nation’s Seaports



Using a method developed at the Lab, cargo ships can be inspected to see if they carry material used for weapons of mass destruction.

Homeland security experts say that terrorist threats are most likely to enter our nation by way of the sea in one of the nearly seven million cargo containers offloaded at U.S. ports every year.

Such threats might one day be thwarted thanks to research conducted on a 40-year-old particle accelerator at Berkeley Lab. A team of scientists led by Berkeley Lab’s Rick Norman used the 88-Inch Cyclotron to demonstrate a technique that might lead to the quick, accurate and safe detection of nuclear materials being smuggled inside sea-going cargo containers.

The researchers showed that irradiating a cargo container’s contents with a beam of neutrons, then measuring the emission of high-energy gamma rays, provides a unique identifying signature of the plutonium or highly enriched uranium used in weapons of mass destruction.

A detection system based on this gamma detection technology could be used to screen every cargo container entering a United States seaport. For more information, visit: [www.lbl.gov/Science-Articles/Archive/sb-NSD-nuclear-contraband.html](http://www.lbl.gov/Science-Articles/Archive/sb-NSD-nuclear-contraband.html)

# Lab and UCSF Unite in Fight Against Cancer

Berkeley Lab and the University of California at San Francisco (UCSF) have joined forces in the fight against cancer. Their partnership, the fruit of a recently signed memorandum of understanding between the two institutions, will promote a multidisciplinary inquiry into the fundamental causes of cancer and help parlay this knowledge into effective therapies. It also underscores the changing nature of cancer research.

“We’re moving toward understanding cancers in their totality,” says Joe Gray, newly appointed director of Berkeley Lab’s Life Sciences Division and current leader of UCSF’s breast oncology and cancer genetics research programs. “It requires expertise in cell and molecular biology, functional imaging, computational biology, nanotechnology, quantitative systems biology, and clinical investigations – no single lab can do this.”

The collaboration will capitalize on the complementary strengths of both institutions. UCSF’s Comprehensive Cancer Center brings expertise in basic cancer biology and genetics, a strong translational cancer research program, and a well-developed clinical program geared toward adopting new advances in cancer management. Berkeley Lab will contribute expertise in fundamental cancer research and state-of-the-art capabilities that quantitatively measure and model the molecular and cellular characteristics of single molecules, cells in culture, and living organisms, including humans. For more information, visit: [www.lbl.gov/Publications/Currents/Archive/Dec-19-2003.html#head0](http://www.lbl.gov/Publications/Currents/Archive/Dec-19-2003.html#head0)



# Efficient Lighting System Wins State Award

Lighting researchers Michael Siminovitch and Erik Page recently received a 2003 California “Flex Your Power Energy Efficiency Award” for their work on an energy-efficient hotel lighting fixture.

The citation reads: “Your achievements in energy efficiency rank among the best in the state and your innovative energy-saving strategies have played a key role in helping California become a world leader in energy efficiency.”

The researchers found that eliminating the unnecessary extended operation of the bathroom fixtures is a major energy saving opportunity. More than 75 percent of the energy used by these fixtures occurs when they are left on for more than two hours at a time.

As a result of the study, Watt Stopper Inc. partnered with Berkeley Lab, the Sacramento Municipal Utility District, DoubleTree Hotels, and the California Energy Commission to develop and test a product that could capture these energy savings in hotel rooms.



These fixtures, developed at Berkeley Lab, reduce the amount of energy used in lighting hotel bathrooms.